Using of the Softwares in the Hungarian Authority

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What we do?

Analysis
- Fixed services
- Broadcasting

Licensing
- Mobile services
- Satellite services
- Other services

Spectrum Management

Measurement
Softwares in Analysis and Licensing

- Every phase of analysis is automated and the licensing is personalized with softwares.
- All kinds of analysis are calculated with different planning softwares.
- One complex system with connections between the databases.
- Digital Terrain Model calculations:
  - Fieldstrength calculation
  - Threshold degradation
  - Coordination calculation
  - Coverage area calculation
  - Power flux density calculation

Huge amount of information can be handled and searched quickly and efficiently.
Potential for error is reduced.
Multitasking in the databases.
ITU recommendations and HCM Agreement are implemented to the planning softwares.

Database of transmitter
**Result of licensing**

- **Decree**
- **Technical parameters**
- **Fee**

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**Calculation of spectrum fee**  
(Broadcasting transmitter)

<table>
<thead>
<tr>
<th>Average ERP</th>
<th>Average effective antenna height</th>
<th>50 m</th>
<th>100 m</th>
<th>150 m</th>
<th>200 m</th>
<th>250 m</th>
<th>350 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 kW/ERP=50 W</td>
<td>800</td>
<td>2 200</td>
<td>1 300</td>
<td>6 500</td>
<td>12 500</td>
<td>21 300</td>
<td></td>
</tr>
<tr>
<td>3 kW/ERP=100 W</td>
<td>1 500</td>
<td>2 800</td>
<td>1 900</td>
<td>6 800</td>
<td>14 800</td>
<td>23 600</td>
<td></td>
</tr>
<tr>
<td>10 kW/ERP=100 W</td>
<td>2 800</td>
<td>4 800</td>
<td>3 900</td>
<td>9 700</td>
<td>19 700</td>
<td>30 000</td>
<td></td>
</tr>
<tr>
<td>0.1 kW/ERP=1 kW</td>
<td>5 200</td>
<td>7 600</td>
<td>6 700</td>
<td>13 400</td>
<td>23 400</td>
<td>33 700</td>
<td></td>
</tr>
<tr>
<td>1 kW/ERP=10 kW</td>
<td>12 700</td>
<td>17 900</td>
<td>16 900</td>
<td>33 200</td>
<td>50 000</td>
<td>70 000</td>
<td></td>
</tr>
<tr>
<td>10 kW/ERP=100 kW</td>
<td>33 300</td>
<td>49 000</td>
<td>47 000</td>
<td>94 000</td>
<td>140 000</td>
<td>200 000</td>
<td></td>
</tr>
<tr>
<td>ERP&gt;100 kW</td>
<td>82 500</td>
<td>120 000</td>
<td>112 500</td>
<td>225 000</td>
<td>392 500</td>
<td>567 500</td>
<td></td>
</tr>
</tbody>
</table>

The spectrum fee is calculated based on a Hungarian decision.
**Main idea was: to develop**

- a new **spectrum management and information** software in Hungary,
- a tool which widely supports the experts **to create, edit, visualize and publish** easily and effectively such a large and complex Hungarian national frequency allocation and the rules of using frequency bands
- a tool which **makes simple overviewed** the 600-page-complex-table
- a tool which helps **the experts, operators or even everybody** in the world **to complete different analyses** and query according to different criteria in the national frequency allocation
### Graphic NFT

**Hungarian Frequency Allocations**

**Radio Service Color Legend**

**Activity Code**

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### Query

**STIR (Specialist Information Retrieval System)**

#### NFT Query

- **Condition:**
  - Radio service category (column H) = Primary
  - (Condition formula) = Frequency band = 230 MHz AND 3G/UMTS AND Fixed AND 10 MHz

#### Frequency Table

<table>
<thead>
<tr>
<th>Lower Frequency</th>
<th>Upper Frequency</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 MHz</td>
<td>512 MHz</td>
<td>FIXED</td>
<td>NE</td>
<td>W</td>
<td>1</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 MHz</td>
<td>512 MHz</td>
<td>FIXED</td>
<td>NE</td>
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<td>D</td>
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<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Note:**
  - Point-to-point, point-to-multipoint systems and general multipoint systems
  - Annex 4

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Softwares in measurement

- Monitoring the spectrum with remote controlled measurement systems
- Programmed measurements
- Quality of broadband internet measurements

Thank you for your attention.